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AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS

OF THE SOCIETY

February 19th, 1913.—The meeting was called to order at 8.30 P. M.; Vice-President J. Waldo Smith in the chair; T. J. McMinn, Assistant Secretary, acting as Secretary; and present, also, 131 members and 19 guests.

A paper by John N. Brooks, Jun. Am. Soc. C. E., entitled "The Infiltration of Ground-Water into Sewers," was presented by the author, and the subject was discussed by Messrs. John H. Gregory, G. L. Christian, Edward S. Rankin, E. Kuichling, Charles Saville, Kenneth Allen, and the author.

A paper by J. L. Meem, Assoc. M. Am. Soc. C. E., entitled "A Suggested Improvement in Building Water-Bound Macadam Roads," was presented by J. C. Meem, M. Am. Soc. C. E., and illustrated with lantern slides. The paper was discussed by Messrs. A. H. Blanchard, who illustrated his remarks with lantern slides, James Owen, and William J. Boucher, and communications on the subject from Messrs. F. G. Frink, C. H. Sweetser, and W. W. Crosby, were read by the Secretary.

A paper entitled "On Long-Time Tests of Portland Cement" by I. Hiroi, M. Am. Soc. C. E., was presented by the Secretary. Written discussions from Messrs. Chandler Davis, L. J. Le Conte, and George G. Honness were presented by title on account of the lateness of the hour.

The Secretary announced the following deaths:

JOHN FRITZ, elected Member, July 5th, 1893; Honorary Member, September 5th, 1899; died February 12th, 1913.

DAVID MCNEELY STAUFFER, elected Member, September 2d, 1874; died February 5th, 1913.

Adjourned.

March 5th, 1913.—The meeting was called to order at 8.30 P. M.; Vice-President J. Waldo Smith in the chair; Charles Warren Hunt, Secretary; and present, also, 121 members and 12 guests.

The minutes of the Annual Meeting, January 15th, and of the meeting of February 5th, 1913, were approved as printed in *Proceedings* for February, 1913.

A paper by Caleb Mills Saville, M. Am. Soc. C. E., entitled "Hydrology of the Panama Canal," was presented by title. The Secretary presented a communication on the subject from Gen. Henry L. Abbot, and the paper was discussed by T. Kennard Thomson, M. Am. Soc. C. E.

At the request of the Chairman, Robert Ridgway, M. Am. Soc. C. E., addressed the meeting on the subject of the Dual System of Rapid Transit in New York City, and the matter was discussed by Messrs. W. J. Boucher, N. P. Lewis, L. D. Rights, and others.

Also at the request of the Chairman, Thomas H. Wiggin, M. Am. Soc. C. E., described a design for a large cast-steel cover in a shaft on the tunnel for the Catskill Aqueduct, and the subject was discussed by Messrs. H. F. Dunham, F. W. Skinner, V. H. Hewes, W. B. Bamford, and others.

The Chair having asked for discussion on the question of making the meetings of the Society more interesting, Messrs. T. Kennard Thomson, W. J. Boucher, and the Secretary expressed their views.

The Secretary announced the election of the following candidates on March 4th, 1913:

AS MEMBERS

WILLIAM GOODSON AMES, Havana, Cuba
HERMAN PETER ANDRESEN, Chicago, Ill.
JOHN TONER BARR, Pittsburgh, Pa.
WILLIAM GODLEY COUGHLIN, Renovo, Pa.
WILLIAM REID FELTON, Lonetree, Mont.
ROBERT RICHARD GALES, Bengal, India

Friederich Ernst Giesecke, College Station, Tex.
John Charles William Greth, Pittsburgh, Pa.
Edward Sherman Jackson, Gooding, Idaho
Charles Nicholas Monsarrat, Montreal, Que., Canada
William Edward Parker, Washington, D. C.
Hugh Pattison, Chicago, Ill.
William Powell Rothrock, Pittsburgh, Pa.
Joseph Aloysius Rourke, Boston, Mass.
Charles George Schade, Canonsburg, Pa.
Francis Lee Weakland, New York City

As Associate Members

William Thomas Adelhelm, Philadelphia, Pa.
Robert Burns Haldane Begg, Lawrence, Kans.
Frank Charles Boes, West New Brighton, N. Y.
Richard Bailey Cook, Easton, Pa.
Ray Edgar Fulcher, Burbank, Wash.
William Goldsmith, New York City
Harry Matt Gray, Poughkeepsie, N. Y.
James Edward Grimes, Chicago Heights, Ill.
John Wardwell Howard, Boston, Mass.
Charles Brown Kingsley, Toronto, Ont., Canada
Ernest Eugene Lee, Culebra, Canal Zone, Panama
Hal Helm Logan, Denver, Colo.
Stanley Macomber, Centralia, Wash.
Joseph Newall McKernan, Plainville, Conn.
John Montgomery Mahon, Jr., Harrisburg, Pa.
Paul McClary Paine, Fellows, Cal.
Arturo Pani, City of Mexico, Mexico
Abraham John Ruth, Cananea, Sonora, Mexico
James Cummin Stevenson, San Antonio, Tex.
Harris Martyn Stringfellow, City of Mexico, Mexico
George Roscoe Blaine Symonds, Manila, Philippine Islands
James Olin Wanzer, Los Baños, Cal.
Herbert Cassidy Wells, Washington, D. C.

As Juniors

Andrew Lewis Ackhart, Toronto, Ont., Canada
Harry Ross Daubenspeck, Johnson, N. C.
William Fisher Drury, Orono, Me.
Richard Henderson Eurich, Montclair, N. J.
Robert Nesbitt Greene, Southington, Conn.
James Warren Ingalls, Lynn, Mass.
Eugene Frederick Mail, Robinson, Ill.

Seaton Schroeder, Jr., Altmar, N. Y.
Robert L'Hommedieu Tate, Princeton Mills, W. Va.
Theodore Ernst Veltfort, Keokuk, Iowa
Chauncy Wernecke, Seattle, Wash.

The Secretary announced the transfer of the following candidates on March 4th, 1913:

From Associate Member to Member

Clifford George Dunnells, Pittsburgh, Pa.
Randall Dunbar Gardner, Boston, Mass.
Kenneth Crothers Grant, Pittsburgh, Pa.
Guy Walter Harris, Los Angeles, Cal.
Ernest Emmanuel Howard, Kansas City, Mo.
Robert Parsons Howell, Phillipsburg, N. J.
Arthur Ernest Morgan, Memphis, Tenn.
John Richard Pill, Corona, Ala.
Blair Ripley, Toronto, Ont., Canada

From Junior to Associate Member

Harold Phillips Farrington, New York City
Willis George Frost, Healdsburg, Cal.
Samuel Arnold Greeley, Winnetka, Ill.
William Heyman, Jersey City, N. J.
Henry James Kesner, Berkeley, Cal.
Thomas George McCrory, Seattle, Wash.
Richard Elam Mieth, Portland, Ore.
Day Ira Okes, Minneapolis, Minn.
Walter Max Sanger, Toledo, Ohio
Oliver Earle Young, Chicora, Fla.

The Secretary announced the following deaths:

Sir William Henry White, elected Honorary Member, December 16th, 1904; died February 27th, 1913.

Albert Safford Cheever, elected Member, June 7th, 1893; died February 17th, 1913.

Rudolph Fink, elected Member, September 21st, 1870; died February 1st, 1913.

Frank Soulé, elected Member, March 1st, 1905; died February 14th, 1913.

Arthur Garfield Crysler, elected Associate Member, August 31st, 1909; died October 22d, 1912.

Adjourned.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

April 2d, 1913.—8.30 P. M.—This will be a regular business meeting. Two papers will be presented for discussion, as follows: "Shearing Strength of Construction Joints in Stems of Reinforced Concrete T-Beams, as Shown by Tests," by Lewis J. Johnson, M. Am. Soc. C. E., and John R. Nichols, Jun. Am. Soc. C. E.; and "Fremantle Graving Dock: Steel Dam Construction for North Wall," by Joshua Fielden Ramsbotham, Assoc. M. Am. Soc. C. E.

These papers were printed in *Proceedings* for February, 1913.

April 16th, 1913.—8.30 P. M.—At this meeting two papers will be presented for discussion as follows: "Kinetic Effect of Crowds," by C. J. Tilden, Assoc. M. Am. Soc. C. E.; and "Some Experiments with Mortars and Concretes Mixed with Asphaltic Oils," by Messrs. Arthur Taylor and Thomas Sanborn.

These papers are printed in this number of *Proceedings*.

May 7th, 1913.—8.30 P. M.—A regular business meeting will be held, and a paper by George Schobinger, Jun. Am. Soc. C. E., entitled "Colorado River Siphon," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

ANNUAL CONVENTION

The Forty-fifth Annual Convention will be held at Ottawa, Ont., Canada, some time between June 1st and July 15th, 1913, the precise date having not yet been fixed.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that, if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Palace Hotel, on the third Friday of February, April,

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Gavin N. Houston, M. Am. Soc. C. E., 409 Equitable Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, and, until further notice, will take place at the Colorado Traffic Club.

Visiting members are urged to attend the meetings and luncheons.

(Abstract of Meeting)

February 8th, 1913.—The meeting was called to order; President Ketchum in the chair; G. N. Houston, Secretary; and present, also, 16 members and 3 guests.

A Progress Report of the Legislative Committee was read by J. E. Field, M. Am. Soc. C. E., and approved.

The Secretary read the Report of the Auditing Committee, which was approved and the Committee discharged.

After discussion on the proposed Amendment to the By-Laws of the Association concerning the election of officers, and on motion, duly seconded, it was ordered that the Nominating Committee be increased to five members to be selected at large from the Association by the Chair.

A paper on "Surety Bonds," by C. L. Martindale, Resident Vice-President of the Equitable Surety Company, was read by Vernon L. Foxwell, Manager of the American Bonding Company, who also discussed the subject. The paper was discussed from the legal standpoint by H. H. Clark, Attorney for the U. S. Fidelity and Guarantee Company.

Adjourned.

Atlanta Association

On March 14th, 1912, the Atlanta Association of Members of the American Society of Civil Engineers was organized, with the following officers: Arthur Pew, President; William A. Hansell, Jr., Secretary; and Messrs. James N. Hazlehurst and Alexander Bonnyman, Members of the Executive Committee. The Association will hold its meetings in the house of the University Club.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms and at all meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Engineers' and Architects' Club of Louisville, Ky., 303 Norton Building, Fourth and Jefferson Streets, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.

Engineers' Society of Northeastern Pennsylvania, 302 Board of Trade Building, Scranton, Pa.

Engineers' Society of Pennsylvania, 219 Market Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

Institution of Engineers of the River Plate, Buenos Aires, Argentine Republic.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.

Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.

Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.

Louisiana Engineering Society, 321 Hibernia Bank Building, New Orleans, La.

Memphis Engineering Society, Memphis, Tenn.

Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.

Montana Society of Engineers, Butte, Mont.

North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.

Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.

Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachsischer Ingenieur- und Architekten-Verein. Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.

Sociedad de Ingenieros del Peru, Lima, Peru.

Societe des Ingenieurs Civils de France, 19 Rue Blanche, Paris, France.

Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.

Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.

Tekniske Forening, Vestre Boulevard 18–1, Copenhagen, Denmark.

Western Society of Engineers. 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From February 3d to March 4th, 1913)

DONATIONS.*

ROADS, PATHS AND BRIDGES.

By Logan Waller Page, M. Am. Soc. C. E. (The Farmer's Practical Library.) Cloth, 7½ x 5 in., illus., 263 pp. New York, Sturgis & Walton Company, 1912. 75 cents.

The Introduction states that it is the purpose in this book to give, in a concise and elementary form, the fundamental principles governing the construction of roads, paths and bridges for farm and neighborhood purposes, and to present the details of construction and maintenance in connection therewith so that they may be easily followed. The author has also included matter relating to the origin and development of road building and the progress of road legislation and administration, as well as a few of the economic phases of the road question. The Chapter headings are: History of Road Building; Road Legislation and Administration; Locations, Surveys, Plans, Specifications; The Earth Road; The Sand-Clay Road; The Gravel Road; The Broken Stone Road; The Selection of Materials for Macadam Roads; Maintenance and Repairs; Roadside Treatment; Modern Road Problems; Paths; Culverts and Bridges; Bibliography; Index.

HANDBOOK OF RAILROAD EXPENSES.

By J. Shirley Eaton. Morocco, 7½ x 5 in., 12 + 559 pp. New York and London, McGraw-Hill Book Company, 1913. $3.00.

The present form of accounting and accounting statistics required of the railroads by the Interstate Commerce Commission is, the preface states, the product of many years of experience and careful study. The author states that as the questions involved in the transportation field, individual and social, will some day be discussed in a manner which will deserve to be termed "scientific", he has attempted to comprehend in these classifications all the economic forces which have play in the transportation business. His intention has been to present a handbook containing a "Classification of Railroad Expenses" which is reasonably complete for all the purposes of the operating official or for the railroad statistician and financier. This analysis, it is said, is intended to supersede that contained in the author's "Railroad Operations—How to Know Them," published about twelve years ago. All existing indexes of expenses have been freely used in compiling this Handbook, and abridged versions of some of the texts of the Interstate Commerce Commission are included. The "Classification" of the Interstate Commerce Commission is given in full with the Commission's later corrections incorporated in the text. The Contents are: The Capital and Income Accounts; Maintenance of Way and Structures; Maintenance of Equipment; Traffic Expenses; Transportation; General Expenses; Outside Operations; Additions and Betterments; Interstate Commerce Commission Texts—Reprinted and Abridged; Index.

THE MODERN GASOLINE AUTOMOBILE:

Its Design, Construction, Maintenance and Repair. By Victor W. Pagé. Cloth, 8¾ x 5¾ in., illus., 693 pp. New York, The Norman W. Henley Publishing Company, 1913. $2.50.

In a secondary title, it is stated, that this book is a comprehensive treatise in which all the principles pertaining to gasoline automobiles and their component parts, are defined, every phase of the subject being treated in a practical, non-technical manner. After explaining the basic principles of the gasoline motor car, the author describes actual forms and mechanisms, in order, it is stated, that their practical application and the relations which the various parts bear each other may be easily understood. In addition to a thorough discussion of the automobile, its equipment, accessories, tools, supplies, spare parts, etc., detailed descriptions of the most recent innovations in 1913 models are given, such as the torpedo and other body forms, sleeve valve motors, selective sliding gearset, shaft and bevel gear drive, worm gear power transmission, magneto ignition, electric lighting systems, etc. Examples from temporary foreign and domestic practice are included, as well as about 500 illustrations which have been made from actual working drawings. The Contents are: Types of Modern Automobiles; How Power is Generated; The Principal Parts of Gasoline Engines, Their Design, Construction and Application; Constructional Details of Pistons; Liquid Fuels Used and Methods of Vaporizing to Obtain Explosive Gas;

* Unless otherwise specified, books in this list have been donated by the publishers.

Automobile Power-Plant Ignition Systems Outlined; Reason for Lubrication of Mechanism; Utility of Clutches and Gearsets Defined; The Chassis and Its Components; Wheels, Rims, and Tires; Motor Car Equipment and Accessories; Operating Advice and Explanation of Automobile Control Methods; Practical Hints to Assist in Locating Power-Plant Troubles; Keeping Up the Motor-Car Chassis; Index.

DIARY OF A ROUNDHOUSE FOREMAN.

By T. S. Reilly. Cloth, 7 x 5 in., 158 pp. New York, The Norman W. Henley Publishing Company, 1912. $1.00.

The subject-matter contained in this book first appeared anonymously in the *Railway and Engineering Review* as a serial. In order to give the man who is about to take charge of a roundhouse that grasp of administrative matters which is essential to his success, it has been assumed that a typical young machinist has been placed in charge of a roundhouse, and his experiences in that position are given. It is stated that all the characters and incidents have been taken from actual railroad life, having passed under the author's personal observation while occupying various positions as a railroad official.

ELEMENTARY PRINCIPLES OF ELECTRICITY AND MAGNETISM.

For Students in Engineering. By Robert Harbison Hough and Walter Martinus Boehm. Cloth, 7½ x 5 in., illus., 7 + 233 pp. New York, The Macmillan Company; London, Macmillan & Co., Ltd., 1913. $1.10.

The object of this book, it is stated, is to develop, in logical order, the more important numerical relations existing among the principal quantities used in electricity and magnetism, from definitions and elementary laws stated in simple language. Only those relations which are fundamental to the design of the various machines and engines used in engineering practice are developed, and no attempt has been made to include any descriptive matter. The text, it is stated, is intended to be used with lecture demonstrations involving three types of experiments, namely, those presenting elementary phenomena or independent experimental laws on which the propositions depend; verification of the principal propositions derived; and illustrations of the more important applications. Problems are included to illustrate the use of formulas, the principal equations being numbered for convenient reference. The Contents are: Magnetism; Magnetic Induction; Electrostatics; Electrostatic Induction; Capacity (Electrostatic); Electrostatic Machines; Electrodynamics (Fields); Quantity; Resistance, Difference of Potential and Capacity; Networks of Conductors; Electrodynamics (Conductors); Electro-Magnetic Induction; Magnetic Circuits; Rotating Coil in Uniform Field; Coefficients of Induction; Alternating Currents; Dynamo Electric Machinery; Appendix; Index.

Gifts have also been received from the following:

Albany, N. Y.-Dept. of Public Works. 1 pam.
Aldershot, England, Gas, Water & Dist. Lighting Co. 2 pam.
Alexandra (Newport and South Wales) Docks & Ry. Co. 1 pam.
Am. Elec. Ry. Assoc. 5 bound vol.
Am. Soc. of Heating and Ventilating Engrs. 1 bound vol.
Am. Soc. of Mech. Engrs. 1 bound vol.
Assoc. of Am. Portland Cement Mfrs. 1 pam.
Assoc. of Transportation and Car Accounting Officers. 1 pam.
Australasian Inst. of Min. Engrs. 4 vol.
Bombay, India-Public Works Dept. 1 pam.
Brockton, Mass.-Water Commr. 1 pam.
Caledonian Ry. Co. 9 pam.
Cambrian Rys. Co. 1 pam.
Central London Ry. Co. 1 pam.
Chicago, Ill.-Bureau of Public Efficiency. 5 pam.
Chicago Junction Rys. & Union Stock Yards Co. 1 pam.
Detroit, Mich.-Board of Water Commrs. 1 pam.
Doubleday, Page & Co. 1 bound vol.
Eureka, Cal.-Board of State Harbor Commrs. 1 pam.
Fall River, Mass.-Watuppa Water Board. 1 pam.
Funk & Wagnalls Co. 1 bound vol.
Furness Ry. Co. 1 pam.
Glasgow & South-Western Ry. Co. 1 pam.
Great Central Ry. Co. 1 pam.
Great Northern Ry. Co. 1 pam.
Great Western Ry. Co. 1 pam.
Hadfield, *Sir* Robert. 1 pam.
Hawaii-Board of Health. 1 vol.
Highland Ry. Co. 1 pam.
Hull & Barnsley Ry. Co. 1 pam.
Illinois-Rivers and Lakes Comm. 1 bound vol., 5 pam.
Illinois, Univ. of. 2 bound vol.
Indiana-State Board of Tax Commrs. 2 pam.
Inst. of Min. and Metallurgy. 1 pam.
Iowa-Geol. Survey. 1 bound vol.

Iowa-State Coll. of Agri. and Mechanic Arts. 1 pam.
Iron and Steel Inst. 1 bound vol., 1 pam.
Junior Institution of Engrs. 1 bound vol.
Kansas-State Board of Health. 1 bound vol.
Liverpool Overhead Ry. Co. 1 pam.
London & North Western Ry. Co. 1 pam.
London, Brighton & South Coast Ry. Co. 1 pam.
London Elec. Ry. Co. 1 pam.
Ludecke, Carl. 1 pam.
Manistee & North Eastern R. R. Co. 3 pam.
Maryland-Mine Insp. for Allegany and Garrett Counties. 1 pam.
Maryland-State Dept. of Health. 1 vol.
Maryport & Carlisle Ry. Co. 1 pam.
Mass. Inst. of Tech. 1 pam.
Metropolitan Ry. Co. 1 pam.
Midland & South Western Junction Ry. Co. 1 pam.
Midland Ry. Co. 1 pam.
Minneapolis & St. Louis R. R. Co. 1 pam.
Municipal Engrs. of the City of New York. 1 pam.
National Elec. Light Assoc. 4 bound vol.
National Fire Protection Assoc. 1 pam.
National Highways Assoc. 1 pam., 1 map.
National Tube Co. 1 bound vol.
Nevada-State Board of Health. 1 pam.
Nevada-State Insp. of Mines. 1 pam.
New England Assoc. of Gas Engrs. 1 bound vol.
New Jersey San. Assoc. 2 pam.
New York City-Bureau of Bldgs. 1 bound vol.
New York City-Dept. of Water Supply, Gas and Electricity. 2 pam.
New York State-Public Service Comm., Second Dist. 8 pam.
New York-State Education Dept. 2 bound vol.
North British Ry. Co. 1 pam.
North Carolina-Board of Health. 1 bound vol.
North Carolina-Geol. and Economic Survey. 1 pam.
North London Ry. Co. 1 pam.
North of England Inst. of Min. and Mech. Engrs. 1 vol.
North Staffordshire Ry. Co. 1 pam.
Northampton, Mass.-Board of Water Commrs. 1 pam.
Ohio-State Highway Dept. 1 pam.
Ohio Elec. Light Assoc. 1 bound vol.
Oklahoma-Geol. Survey. 1 pam.
Ontario, Canada-Bureau of Mines. 1 bound vol.
Ontario Assoc. of Archts. 1 pam.
Pacific Northwest Soc. of Engrs. 1 pam.
Pennsylvania R. R. Co. 2 pam.
Permanent Inter. Assoc. of Navigation Congresses. 4 bound vol., 4 pam.
Pittsburgh Univ. 1 bound vol.
R. Scuola d'Applicazione per gli'Ingegneri in Roma. 1 pam.
Ry. Signal Assoc. 1 bound vol.
Reading, Mass.-Water Commrs. 1 pam.
Rhymney Ry. Co. 1 pam.
Royal Philosophical Soc. of Glasgow. 1 vol.
Russell, S. Bent. 1 pam.
St. Joseph & Grand Island Ry. Co. 1 pam.
St. Louis, Mo.-Water Commr. 1 pam.
Sanderson & Porter. 1 pam.
Saskatchewan, Canada-Dept. of Public Works. 1 pam.
Schiffbautechnische Gesellschaft. 1 bound vol.
Sharon Ry. Co. 7 pam.
Sherman, Richard W. 1 pam.
Smithsonian Institution. 7 pam.
Société Belge des Ingénieurs et des Industriels. 1 pam.
Soc. of Constructors of Federal Bldgs. 1 pam.
Soc. of Engrs. 1 bound vol.
South Eastern Ry. Co. 1 pam.
Stowell, Hugh. 1 pam.
Swaab, S. M. 1 pam.
Sweitzer, N. B. 1 pam.
Switzerland-Landeshydrographie. 1 pam
Taff Vale Ry. Co. 1 pam.
Texas-R. R. Comm. 1 vol.
United Rys. Co. of St. Louis. 11 pam.
U. S.-Adjutant-Gen. 2 vol.
U. S.-Bureau of Mines. 1 pam.
U. S.-Geol. Survey. 2 bound vol., 2 vol., 7 pam.
U. S.-Isthmian Canal Comm. 1 pam.
U. S.-Navy Dept. 1 pam.
U. S.-Office of Exper. Stations. 1 pam.
U. S.-Senate. 1 pam.
Utah-State Mine Insp. 1 pam.
Verein Beratender Ingenieure. 3 pam.
Vermont-State Board of Health. 2 bound vol.
Victoria, Australia-Mines Dept. 2 vol.
Washington-Highway Commr. 1 bound vol.
Washington Soc. of Engrs. 1 pam.
Western Australia-Geol. Survey. 3 pam.
Winnipeg, Man.-City Engr. 1 pam.
Wisconsin-State Board of Health. 1 pam.
Wisconsin-State Forester. 1 pam.
Wyoming-State Engr. 1 pam.
Wyoming-State Geologist. 1 pam.

BY PURCHASE

Tunneling: A Practical Treatise. By Charles Prelini. Sixth Edition, Revised and Enlarged. D. Van Nostrand Co., New York, 1912.

A Treatise on the Design and Construction of Roofs. By N. Clifford Ricker. John Wiley & Sons, New York; Chapman & Hall, Limited, London, 1912.

Explosives: A Synoptic and Critical Treatment of the Literature of the Subject as Gathered from Various Sources. By H. Brunswig.

Translated and Annotated by Charles E. Munroe and Alton L. Kibler. John Wiley & Sons, New York; Chapman & Hall, Limited, London, 1912.

A Textbook on Sewage Disposal in the United Kingdom. By Henry Lemmoin-Cannon. With a Foreword by *Sir* Alexander Stenning. St. Bride's Press, Limited, London, 1912.

Water Supply and Drainage Systematised and Simplified. By C. E. Housden. Longmans, Green and Co., New York and London, 1912.

The Mechanics of the Aeroplane: A Study of the Principles of Flight. By Captain Duchene. Translated from the French by John H. Ledeboer and T. O'B. Hubbard. Longmans, Green and Co., New York and London, 1912.

Military Hygiene and Sanitation. By Charles H. Melville. Edward Arnold, London, 1912.

The Una-Flow Steam-Engine. By J. Stumpf. D. Van Nostrand Co., New York; Constable & Company, Ltd., London, 1912.

Deutscher Ausschuss für Eisenbeton. Hefte 6-22. Wilhelm Ernst & Sohn, Berlin, 1911-13.

Mitteilungen über Forschungsarbeiten auf dem Gebiete des Ingenieurwesens, insbesondere aus den Laboratorien der technischen Hochschulen. Herausgegeben vom Verein deutscher Ingenieure. Hefte 129-130. Julius Springer, Berlin, 1912.

Revue Générale des Chemins de Fer, 7e Année, 1er Semestre, January-June, 1884. Dunod, Paris.

Poor's Manual of the Railroads of the United States, 1913. Poor's Railroad Manual Co., New York.

Zeitschrift des Vereines deutscher Ingenieure: Inhaltsverzeichnis der Jahrgänge 1904 bis 1910, Band 48 bis 54. Julius Springer, Berlin, 1911.

SUMMARY OF ACCESSIONS

(From February 3d to March 4th, 1913)

Donations (including 12 duplicates)	223
By purchase	30
Total	253

MEMBERSHIP

ADDITIONS

(From February 7th to March 6th, 1913)

		Date of Membership.
MEMBERS		
BETTS, EDWARD EVERETT. Cons. Engr. (Edward E. Betts Eng. Co.), 703 James Bldg., Chattanooga, Tenn.	Assoc. M. M.	April 5, 1899 Feb. 4, 1913
CUNNINGHAM, EDWARD WALTER. Asst. Bldg. Insp., Dept. of Public Safety, City of Cleveland, 11020 Detroit St., Cleveland, Ohio.	Assoc. M. M.	Oct. 2, 1907 Feb. 4, 1913
DARROW, WILTON JOSEPH. Cons. Engr., 70 East 45th St., New York City.	Assoc. M. M.	Nov. 1, 1905 Feb. 4, 1913
HORTENSTINE, HENRY ROBERTS. Contr. Mgr., Penn Bridge Co., Beaver Falls, Pa.	Assoc. M. M.	April 3, 1907 Feb. 4, 1913
MATHESON, ERNEST GEORGE. Supt., The Foundation Co., C. P. R. Pitt River Bridge, P. O. Box 68, Coquitlam, B. C., Canada.	Assoc. M. M.	June 1, 1904 Feb. 4, 1913
NICHOLS, WALTER SWAIN. 717 Walnut St., Philadelphia, Pa.		Feb. 4, 1913
PARMELEE, CHARLES LESTER. Cons. Engr., 30 Church St., New York City.		Feb. 4, 1913
SANDS, EDWARD EMMET. Superv. Engr., Dept. of Natural Resources, C. P. Ry., Calgary, Alberta, Canada.	Assoc. M. M.	Sept. 5, 1911 Feb. 4, 1913
THOMAS, WILLIAM JOHN. Chf. Engr., Geo. B. Post & Sons, 1977 Morris Ave., New York City.		Feb. 4, 1913
WEBBER, CHARLES PERKINS. Ingeniero Principal, Departmento de Construccion, Ferro Carriles Nationales de Mexico, Apartado 11, Tierra Blanca, Ver., Mexico.	Assoc. M. M.	Oct. 7, 1908 Jan. 7, 1913
WEIR, MAX WAKEMAN. Engr., The Comm. for the Drainage of the Tonawanda and Oak Orchard Swamps, Elba, N. Y.		Feb. 4, 1913
ASSOCIATE MEMBERS		
BALDRIDGE, JAMES RAMSEY. Contr. Engr., Hennebique Constr. Co., 1170 Broadway, New York City.	Jun. Assoc. M.	Dec. 4, 1906 Oct. 29, 1912
CONKLIN, CHARLES DENTON, JR. Cons. and Designing Structural Engr., Reed Bldg., Philadelphia (Res., Cheltenham), Pa.		Feb. 4, 1913
CONNELLY, JOSEPH AUGUSTINE ALOYSIUS. Asst. Engr., Public Service Comm., First Dist., 888 Forest Ave., New York City.		Feb. 4, 1913
CONVERSE, WARREN HOOVER, JR. Designing Engr., The Converse Bridge Co., Ridgedale Sta., Chattanooga, Tenn.		Jan. 7, 1913

ASSOCIATE MEMBERS (*Continued*)		Date of Membership.
COOPER, SIDNEY WOODDELL. Drainage Engr., U. S. Dept. of Agri., Roswell, N. Mex		Jan. 7, 1913
DUFFEE, LOUIS WARREN. Chf. Engr., Constr., Meridian & Memphis R. R., Box 733, Meridian, Miss.		Feb. 4, 1913
ELLSWORTH, CLARENCE EUGENE. In Chg., U. S. Geological Survey Water Supply Investigations, Yukon-Tanana Region, Alaska, 1757 You St., Washington, D. C.		Feb. 4, 1913
ENTENMANN, PAUL MAX. Asst. Engr., Public Service Comm., First Dist., 943 East 22d St., Brooklyn, N. Y.	Jun. Assoc. M.	Mar. 1, 1910 Feb. 4, 1913
ESTEN, HOWARD FOSS. Asst. Engr., N. Y., N. H. & H. R. R., 533 Hope St., Providence, R. I.	Jun. Assoc. M.	Jan. 2, 1906 Feb. 4, 1913
FINLEY, CHARLES MACFARLANE. 208 American Blk., Sioux City, Iowa		Feb. 4, 1913
GARDNER, HENRY JAMES, JR. Prin. Asst. Engr., Ricker & Minniss, 702 Ellicott Sq., Buffalo, N. Y.	Jun. Assoc. M.	Oct. 31, 1911 Feb. 4, 1913
GRANDPRÉ, AMBROSE GOULET. Supt of Constr., Marshall & Fox, 5343 Ellis Ave., Chicago, Ill		Dec. 3, 1912
GRIMES, ERNEST EDMUND. Care, Utah Ry., 516 Felt Bldg., Salt Lake City, Utah		Feb. 4, 1913
HATCH, FREDERICK NATHANIEL. With Westinghouse, Church, Kerr & Co., 86 Philip St., Jersey City, N. J	Jun. Assoc. M.	June 4, 1907 Feb. 4, 1913
HICKERSON, THOMAS FELIX. Associate Prof. of Civ. Eng., Univ. of North Carolina, Chapel Hill, N. C.		Feb. 4, 1913
HULL, GORDON BURNETT GIFFORD. Asst. Supt., Boquilla Dam, for Mexican Northern Power Co., Ciudad Camargo, Chihuahua, Mexico	Jun. Assoc. M.	July 1, 1909 Feb. 4, 1913
JOHNSTONE, ALAN MOORE EDWARD. 2142 Ellis Ave., New York City		Feb. 4, 1913
KEENE, WILLIAM ARCHIBALD, JR. Chf. Engr., White River Levee Dist., Box 276, Cotton Plant, Ark.		Feb. 4, 1913
MCCARTHY, DANIEL FRANCIS. Bronxville, N. Y.		Sept. 3, 1912
MCSWAIN, THOMAS RUCKER. City Engr., Tulare, Cal.		Jan. 7, 1913
MAYO, GEOFFREY WAINMAN. Designing Engr., Dept. of Eng. and Public Works, Care, City Engr., Manila, Philippine Islands		Dec. 3, 1912
PACKARD, AMBROSE. Engr., Pres., and Mgr., J. S. Packard Dredging Co. and Packard Hydr. Dredging Co., 93 South Angell St., Providence, R. I.		Feb. 4, 1913
REIMANN-HANSEN, ROBERT LOUIS. Head Draftsman, B. & O. R. R., 3637 Park Heights Ave., Baltimore, Md	Jun. Assoc. M.	Oct. 3, 1905 Feb. 4, 1913

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
SAMPSON, GEORGE ARTHUR. Prin. Asst. to Robert Spurr Weston, 695 Washington St., Brighton, Mass		Feb. 4, 1913
SHELLEY, OSWALD PROCTER. Engr., Lilley & Thurston Co., 310 Rialto Bldg., San Francisco, Cal	Jun.	April 5, 1904
	Assoc. M.	Oct. 29, 1912
SMULSKI, EDWARD. With Sanford E. Thompson, in Chg. of Dept. of Design, 141 Milk St., Room 809, Boston, Mass		Feb. 4, 1913
STEEP, JAMES BIGELOW. Chf. Engr., Noelke Richards Iron Works, 1732 North Illinois St., Indianapolis, Ind		Feb. 4, 1913
TAYLOR, HENRY WILLIAM. Hydr. and San. Engr., 100 State St. (Res., 346 State St.), Albany, N. Y		Feb. 4, 1913
TIRRELL, CHARLES EDWARDS. Chf. Engr., A. Friederich & Sons Co., 106 Mill St., Rochester, N. Y	Jun.	Sept. 4, 1906
	Assoc. M.	Feb. 4, 1913
WEBSTER, ROYAL SYLVESTER. Asst. Engr., Havana Central R. R., Arsenal, Havana, Cuba	Jun.	Oct. 6, 1903
	Assoc. M.	Feb. 4, 1913
WILSON, JOHN JUNIOR. 330 Mapleton Ave., Boulder, Colo.		Feb. 4, 1913

JUNIORS

DODGE, FRANK EARLE. Engr. on Constr., for Knickerbocker Portland Cement Co., Hudson, N. Y		Feb. 4, 1913
LEE, CHESTER SHERMAN. Engr., M. of W., Otsego & Herkimer R. R., Cooperstown, N. Y		Feb. 4, 1913
LEWIS, HAROLD MACLEAN. With George W. Fuller, 170 Broadway, New York City (Res., 1511 Albermarle Rd., Brooklyn, N. Y.)		Feb. 4, 1913
ORT, ALBERT AUGUST LAMBERT. Vice-Pres. and Engr. in Chg., Pitometer Dept., The Municipal Supply Co., 601 Western Union Bldg., Chicago, Ill		Sept. 3, 1912
PORTER, ELMER ALFRED. Asst. Engr., U. S. Geological Survey, Salt Lake City, Utah		Oct. 1, 1912
RASMUSSEN, ALVIN CHRISTIAN. Asst. Engr., Insley Mfg. Co., 2250 Central Ave., Indianapolis, Ind		Feb. 4, 1913
WELLS, JAMES BERTRAND. With Eng. Dept., Standard Oil Co., 365 Guinda St., Palo Alto, Cal		Jan. 7, 1913

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ADAMS, EDWIN GRIGGS. Care, Riter-Conley Mfg. Co., Pittsburgh, Pa.

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FOX, CHARLES KIRBY. R. F. D. 2-21, Pomona, Cal.

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FREW, ARCHIBALD JOHN RUSSELL. Hoskin Bldg., Sydney, New South Wales, Australia.

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HILL, WALTER NICKERSON. Asst. Engr., U. S. Reclamation Service, Malta, Mont.

HUFSCHMIDT, WILLIAM PAUL. Wiggins, Colo.

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MURPHY, JOHN JOSEPH. Asst. Engr., Dept. of Public Works, Borough of Manhattan, 13 Park Row, New York City (Res., 12 Amakassin, Yonkers, N. Y.).

NICHOLS, HENRY FRANCIS. Engr. and Machinery Merchant, 122 Grenfell St., Adelaide, South Australia.

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SQUIRE, HARRY EDWIN. 333 Hugo St., San Francisco, Cal.

SYKES, JOHN WALLACE JONES. Asst. Engr., The Laclede Gas Light Co., 1626 Chemical Bldg., St. Louis, Mo.

TALLMAN, LEROY. Supt., Pittsburg Contr. Co., Care, Booth & Flinn, 320 Market St., Newark, N. J.

TEFFT, WILLIAM WOLCOTT. Civ. and Hydr. Engr., 708 Wildwood St., Jackson, Mich.

THAYER, NATHANIEL AUGUSTINE. Structural Steel Draftsman, Board of Education, 139 West 75th St., New York City.

THEBAN, JOHN GERARD. Engr. in Chg., Queensboro Bridge, 305 East 60th St., New York City.

TITSWORTH, RALPH BENTLEY. 355 West Grand Boulevard, Detroit, Mich.

TUCKER, HERMAN FRANKLIN. Cons. Engr., 1011 Alaska Bldg., Seattle, Wash.

VAN SCOYOC, HARRY STEWART. Insp. Engr., Canada Cement Co., Ltd., Montreal, Que., Canada.

ASSOCIATE MEMBERS (*Continued*)

WADDELL, FREDERICK CREELMAN. Vice-Pres., Grant & Ruhling Co., 373 Fourth Ave., New York City (Res., 158 Wardwell Ave., West New Brighton, N. Y.).

WILLIAMS, WALTER SCOTT. Associate Prof., Topographic Eng., Univ. of Missouri, 818 Virginia Ave., Columbia, Mo.

WILSON, WILLIAM RENFREW. Dist. Engr., Canton-Hankow Ry., Hankow, China.

WINN, WALTER SCOTT. Engr. of Surveys, Alabama Power Co., 1147 Brown-Marx Bldg., Birmingham, Ala.

YEN, TE CHING. Managing-Director, Canton-Hankow Ry., Hankow, China.

ASSOCIATES

BELZNER, THEODORE. Insp.-in-Chg., Reinforcing of End Spans, Williamsburgh Bridge, Dept. of Bridges, City of New York, 400 Kent Ave., Brooklyn, N. Y. (Res., 606 West 135th St., New York City).

JOHNSON, ARTHUR AUGUSTINE. 280 Barclay St., Flushing, N. Y.

JUNIORS

BEGGS, GEORGE ERLE. Chf. Engr., The Phosphate Min. Co., Nichols, Fla.

BILYEU, CHARLES SMITH. New York Representative, Colby & Christie of Philadelphia, 170 West 78th St., New York City.

BUSHELL, ARTHUR WILLIAM. Asst. Engr., Manila Ry., Manila, Philippine Islands.

CAFFALL, GEOFFREY ARTHUR. 5726 Center Ave., Pittsburgh, Pa.

DIMMLER, CHARLES LOUIS. 1547 Euclid Ave., Berkeley, Cal.

DUBUIS, JOHN. Pacific Power & Light Co., Hood River, Ore.

EBERLY, VIRGIL ALLEN. Care, Office of Tests, Sante Fé Ry., Topeka, Kans.

FARLEY, MARCUS MARTIN. Care, Board of Water Supply of City of New York, 165 Broadway, New York City.

FIELD, CLESSON HERBERT. With Lackawanna Steel Co. (Res., 516 Elmwood Ave.), Buffalo, N. Y.

GOODRICH, THOMAS MACLENATHEN. General Delivery, Winnipeg, Man., Canada.

HENES, HARRY WILLIAM. Mech. Engr. with A. Bolter's Sons, 118 North La Salle St. (Res., 448 Barry Ave.), Chicago, Ill.

HUBBARD, DANIEL. Div. Engr., Antofagasta-Bolivia Ry., Casilla 428, La Paz, Bolivia.

HUTCHINS, EVERETT NELSON. Care, Directors of the Port, 40 Central St., Boston, Mass.

JAMES, JOHN RAYMOND. 715 East Huron St., Ann Arbor, Mich.

LYNDE, HARRY MILTON. Drainage Engr., Office of Experiment Stations, U. S. Dept. of Agri., West Raleigh, N. C.

MOORE, JAMES GATES. Care, Trumbo Dredging Co., Miami, Fla.

NELSON, ERNEST BENJAMIN. Draftsman, Barnett-McQueen Co., Ltd., Cuthbertson Blk., Fort Williams, Ont., Canada.

OHRT, FREDERICK. 234 Gibbs St., Portland, Ore.

JUNIORS (*Continued*)

PATTERSON, IRVING WOOSTER. Chf. Engr., Rhode Island State Board of Public Roads, 484 Elmwood Ave., Providence, R. I.

SAXE, VAN RENSSELAER POWELL. Pres., Standard Concrete Steel Co., Knickerbocker Bldg., Baltimore, Md.

SMALLMAN, RALPH ALCORN. Care, Carroll Blake Constr. Co., 1617 Am. Trust Bldg., Birmingham, Ala.

SMITH, ROY ELMER. 2345 Minor Ave., N., Seattle, Wash.

STIEVE, WILLIAM MATTHEW. 521 West 134th St., New York City.

TILLSON, EDWIN DELEVAN. Eng. Dept., Distrib. Div., Commonwealth Edison Co., Chicago (Res., Glencoe), Ill.

TORRALBAS, RAFAEL JOAQUIN. 75 Estrada Palma, Vibora, Havana, Cuba.

WARRACK, JAMES BALDWIN. Gen. Supt., Dominion Constr. Co., 509 Richards St., Vancouver, B. C., Canada.

DEATHS

CHEEVER, ALBERT SAFFORD. Elected Member, June 7th, 1893; died February 17th, 1913.

FINK, RUDOLPH. Elected Member, September 21st, 1870; died February 1st, 1913.

FRITZ, JOHN. Elected Member, July 5th, 1893; Honorary Member, September 5th, 1899; died, February 12th, 1913.

SOULÉ, FRANK. Elected Member, March 1st, 1905; died February 14th, 1913.

STAUFFER, DAVID MCNEELY. Elected Member, September 2d, 1874; died February 5th, 1913.

WHITE, *Sir* WILLIAM HENRY. Elected Honorary Member, December 16th, 1904; died February 27th, 1913.

Total Membership of the Society, March 6th, 1913, 6 823.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(February 3d to March 4th, 1913)

NOTE.—*This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.*

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

(1) *Journal*, Assoc. Eng. Soc., Boston, Mass., 30c.
(2) *Proceedings*, Engrs. Club of Phila., Philadelphia, Pa.
(3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
(4) *Journal*, Western Soc. of Engrs., Chicago, Ill., 50c.
(5) *Transactions*, Can. Soc. C. E., Montreal, Que., Canada.
(6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
(7) *Gesundheits Ingenieur*, München, Germany.
(8) *Stevens Institute Indicator*, Hoboken, N. J., 50c.
(9) *Engineering Magazine*, New York City, 25c.
(10) *Cassier's Magazine*, New York City, 25c.
(11) *Engineering* (London), W. H. Wiley, New York City, 25c.
(12) *The Engineer* (London), International News Co., New York City, 35c.
(13) *Engineering News*, New York City, 15c.
(14) *Engineering Record*, New York City, 10c.
(15) *Railway Age Gazette*, New York City, 15c.
(16) *Engineering and Mining Journal*, New York City, 15c.
(17) *Electric Railway Journal*, New York City, 10c.
(18) *Railway and Engineering Review*, Chicago, Ill., 15c.
(19) *Scientific American Supplement*, New York City, 10c.
(20) *Iron Age*, New York City, 20c.
(21) *Railway Engineer*, London, England, 1s. 2d.
(22) *Iron and Coal Trades Review*, London, England, 6d.
(24) *American Gas Light Journal*, New York City, 10c.
(25) *American Engineer*, New York City, 20c.
(26) *Electrical Review*, London, England, 4d.
(27) *Electrical World*, New York City, 10c.
(28) *Journal*, New England Water-Works Assoc., Boston, Mass., $1.
(29) *Journal*, Royal Society of Arts, London, England, 6d.
(30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium, 4 fr.
(31) *Annales* de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand, Brussels, Belgium, 4 fr.
(32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
(33) *Le Génie Civil*, Paris, France, 1 fr.
(34) *Portefeuille Economiques des Machines*, Paris, France.
(35) *Nouvelles Annales de la Construction*, Paris, France.
(36) *Cornell Civil Engineer*, Ithaca, N. Y.
(37) *Revue de Mécanique*, Paris, France.
(38) *Revue Générale des Chemins de Fer et des Tramways*, Paris, France.
(39) *Technisches Gemeindeblatt*, Berlin, Germany, 0, 70m.
(40) *Zentralblatt der Bauverwaltung*, Berlin, Germany, 60 pfg.
(41) *Elektrotechnische Zeitschrift*, Berlin, Germany.
(42) *Proceedings*, Am. Inst. Elec. Engrs., New York City, $1.
(43) *Annales des Ponts et Chaussées*, Paris, France.
(44) *Journal*, Military Service Institution, Governors Island, New York Harbor, 50c.
(45) *Mines and Minerals*, Scranton, Pa., 25c.
(46) *Scientific American*, New York City, 15c.
(47) *Mechanical Engineer*, Manchester, England, 3d.
(48) *Zeitschrift*, Verein Deutscher Ingenieure, Berlin, Germany, 1, 60m.
(49) *Zeitschrift für Bauwesen*, Berlin, Germany.
(50) *Stahl und Eisen*, Düsseldorf, Germany.
(51) *Deutsche Bauzeitung*, Berlin, Germany.
(52) *Rigasche Industrie-Zeitung*, Riga, Russia, 25 kop.
(53) *Zeitschrift*, Oesterreichischer Ingenieur und Architekten Verein, Vienna, Austria, 70h.

(54) *Transactions*, Am. Soc. C. E., New York City, $4.
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(56) *Transactions*, Am. Inst. Min. Engrs., New York City, $6.
(57) *Colliery Guardian*, London, England, 5d.
(58) *Proceedings*, Engrs.' Soc. W. Pa., 803 Fulton Bldg., Pittsburgh, Pa., 50c.
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(62) *Industrial World*, 59 Ninth St., Pittsburgh, Pa., 10c.
(63) *Minutes of Proceedings*, Inst. C. E., London, England.
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(70) *Engineering Review*, New York City, 10c.
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(84) *Le Ciment*, Paris, France.
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A Mile of Test Pavements on Second Avenue, New York. H. W. Durham. (14) Feb. 22.
Relative Advantages of Laying Brick Pavements on Sand Foundations and Cement Concrete Foundations. Robert Hoffman, M. Am. Soc. C. E. (Abstract of paper read before Am. Assoc. for the Advancement of Sci.) (86) Feb. 26.
Some Conditions Affecting the Interaction of Motor Vehicle Wheels and Road Surfaces. L. I. Hewes. (Paper read before Am. Assoc. for the Advancement of Sci.) (86) Feb. 26.
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The City Traffic Census as Conducted by the Bureau of Highways, Borough of Brooklyn, New York City. W. H. Messenger. (Abstract of paper read before Am. Assoc. for the Advancement of Sci.) (86) Feb. 26.
Brick Pavements for Country Roads.* William C. Perkins. (Paper read before Am. Assoc. for the Advancement of Sci.) (96) Feb. 27; (60) Feb.; (86) Feb. 19.
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Discussion on Rates and Fares. William J. Clark. (Paper read before the Am. Elec. Ry. Assoc.) (17) Feb. 1.
Effect of Load Factor on Cost of Electric Railway Passenger Service. C. N. Duffy. (Paper read before the Am. Elec. Ry. Assoc.) (17) Feb. 1.
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A Plea for Scientific Research in the Field of Sewage Purification. A. J. Martin. (Paper read before the Inst. of San. Engrs.) (104) Feb. 21.
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Street Cleaning Costs at Spokane, Wash., in 1912. S. A. Levington. (13) Feb. 27.
Specifications for Drain Tile and Sewer Pipe. (Report of Comm., Iowa State Drainage Assoc.) (14) Mar. 1.
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Die badetechnische Einrichtung des Stadtbades Mülheim a. d. Ruhr.* K. Klaus. (7) Jan. 18.
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Some Experimental Treatments with Reference to the Effect of Initial Air Pressure on Penetration of Creosote. R. S. Belcher. (Paper read before the Am. Wood Preservers' Assoc.) (87) Feb.
Oil-Mixed Concrete. Logan Waller Page. (From *Bulletin No. 46*, U. S. Office of Public Roads.) (87) Feb.
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